How PIDs Demonstrate Identity

And why that’s better for research integrity than verification

Julie Petro
ORCID

Chris Shillum
ORCID

Tom Demeranville
ORCID
Demonstrating identity can help repair and uphold trust in the scholarly record

1. Why is there a crisis in research integrity?
2. ORCID’s commitment to upholding research integrity
3. How Trust Markers in ORCID records help demonstrate identity
4. Together, ORCID’s Members form our Community Trust Network
5. Trust Markers in action — use cases from the community
6. Participative Discussion and Q&A
The Research Integrity Crisis
The integrity of the scholarly record is in question

"The publishing world is faced with a large and problematic pollution of the publication record with false and inaccurate research, risking public trust in research, introducing dangers to public health and medicine, and undermining the research process. Many of these papers originate from third party commercial agencies offering services to authors ("paper mills") for the creation of fake or manipulated data and articles."

COPE position statement, 19 Jan 2024

"Estimates suggest that hundreds of thousands of paper-mill publications are polluting the scientific literature. Paper mills often sell authorships on bogus papers to researchers trying to pad their CVs. One analysis indicates that some 2% of all scientific papers published in 2022 resembled paper-mill productions."

How big is science's fake-paper problem? Richard Van Noorden, 6 Nov 2023

"Tens of thousands of bogus research papers are being published in journals in an international scandal that is worsening every year, scientists have warned. Medical research is being compromised, drug development hindered and promising academic research jeopardised thanks to a global wave of sham science that is sweeping laboratories and universities."

The situation has become appalling, Robin McKie, 3 Feb 2024
Multiple factors are driving the crisis

**Rising pressures** on researchers to “publish or perish”, with career advancement dependent on peer reviewed publication and citations

Publishers **focused** on shifts in **business model** through the Open Access transition

New business models that risk incentivizing publication **volume** and **speed** over **quality**, including the rise of special issues

Lightning-fast uptake of **generative AI tools** reducing the effort to create plausible “fake” research
A multi-layered community-wide approach is needed to verify research: the “Pyramid of Trust”

1. Research integrity/Ethics
   - Work is verified as real research, written by identified, human researchers, and conflicts have been declared

2. Solid science/Reproducibility
   - The work complies with community standards, links to used data and software, and has been peer-reviewed and revised

3. Key entities/Assertions
   - This is what the work claims and covers — results and conclusions

4. Relations/Comparisons
   - Comparison to other work; New, supporting/contradicting findings; impacts/outcomes; citations/cited by; use in policy and patents

Can be asserted by different actors, for different reasons at different times

Adapted from the “Triangle of Trust” by Anita de Waard, VP Research Collaborations, Elsevier
PID\text{s such as ORCID IDs are essential to tracking and analyzing the key relationships between the entities of research

- The \textit{track record} of researchers can be considered through previous works, peer reviews and funding awards.
- \textbf{Affiliations} between researchers and their institutions and be \textit{validated}.
- Networks of \textbf{bad actors} can be \textit{visualized} and \textit{analyzed}: 
  - Paper Mills
  - Citation rings
  - Corrupt editors/guest editors/editorial boards
We believe identity validation is part of the solution, but what is actually helpful and appropriate for our use cases?

**Traditional government ID:**

- Validated legal name
- Validated home address
- Validated date of birth
- Physical appearance
We believe identity validation is part of the solution, but what is actually helpful and appropriate for our use cases?

Traditional government ID:

- Useful if you want to sue the researcher, but not for much else
- Intrusive from a privacy point of view
- Difficult to apply consistently around in all countries
We believe identity validation is part of the solution, but what is actually helpful and appropriate for our use cases?

**Traditional government ID:**
- Validated academic affiliation
- Validated educational record
- Validated funding awards
- Validated previously published works

**Scholarly bona-fides:**
- Validated academic affiliation
- Validated educational record
- Validated funding awards
- Validated previously published works

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**Scholarly bona-fides:**

- Likely strong correlation with genuine researchers
- Information that researchers generally make public on their profiles
- Universally used around the world
ORCID’s Commitment to Trust
The ability to uniquely identify researchers is critical to a trustworthy scholarly record.
ORCID was built from the ground up to earn the broadest possible trust of the communities we serve

- Legal incorporation as US non-profit entity
- Membership organization open to all
- Governed by board elected by our members
- Legally binding membership agreements
- Privacy policy regulated by GDPR and other national regulations
- Legally binding employment agreements, code of conduct, etc.

- Founding principles and values
- Commitment to researcher control
- Open source software and FAIR open data
- Equitable, sustainable business model
- Holding ourselves accountable by working openly
- Continuous community engagement and dialogue

https://info.orcid.org/orcid-trust/
We aim to balance researcher control and data quality

**Researcher control**

- Researchers ...
  - Own their own records
  - Control who accesses their information
  - May change access preferences *at any time*

**Data quality**

- Terms of use prevent misrepresentation
- False data in records may be disputed by anyone in the community
- Machine-learning algorithm detects obvious spam
- Disputed and spam records are removed from use, pending correction or withdrawal

Organizations may only add information to ORCID records with the researcher’s permission, and may only update or delete information that was added by them.

Trust in an ORCID record accumulates over time as reliable and trustworthy data sources add information (with the record holder’s permission).

https://info.orcid.org/balancing-researcher-control-and-data-integrity/
Researchers are in full control of their ORCID records

Data can only be added by the record holder themselves...

...or, by an ORCID member organization, with the record holder’s permission

Fine-grained privacy controls let researchers control the visibility of each item in their record
ORCID is committed to helping address the research integrity crisis

The COPE & STM Paper Mills Research report recommended “Continued investment in tools and systems to detect potential paper mill manuscripts at submission, with consistent and shared guidance in the use of these tools”

Putting things into action:

1. ORCID is a signatory to the United2Act Consensus Statement — ORCID is closely involved in workstream 4: “Enable the development of trust markers

2. ORCID is collaborating closely with STM Solutions Integrity Hub and Research Identification working groups

3. We are recommending the use of ORCID Record Summaries and trust markers in editorial workflows with publishers and vendors

ORCID Trust Markers help demonstrate identity
Researchers use ORCID in a variety of ways

For example, when submitting a manuscript or grant application, researchers may:

- Sign into the submission system using their ORCID iD
- Have their submission form pre-filled based on their ORCID record
- Have their ORCID iD and their collaborators ORCID iDs included in the work metadata
- Have their ORCID record automatically updated with the work once published

Editors might:

- Review ORCID records to help with research integrity checks

Reviewers might:

- Sign into the submission system using their ORCID iD
- Get credit for review work by having peer review activity added to their ORCID record
Information on ORCID records can help with decision making

- Affiliations
- Professional activities
- Funding information
- Publications
- Other outputs
- Peer reviews
- Website URLs
Validated information is even more useful

When an ORCID member updates an ORCID record, the source (provenance) of that update is captured for re-use:

- **Research organizations** add affiliations
- **Publishers** add outputs and reviews
- **Funders** add funding awards

These provide ‘trust markers’ that can be used to help in decision making.
Our community driven trust network means ORCID records accumulate trustworthiness over time.

Validated Trust Markers added to records by our member organizations allows researchers to demonstrate their scholarly bona fides.

Collecting authenticated ORCID IDs gives confidence that the record holder has authority over their record.
ORCID has made it easier to find trust markers

ORCID records can be complex and time consuming for editors to assess.

- Trust markers can be found throughout an ORCID record.
- Locating individual markers was tricky, especially on a large and detailed record.
- We’ve provided editors with a simple to understand summary of the record’s ‘trust markers’ in context within their editorial system
- Making it easier to identify fraudulent and low quality submissions
Record Summaries can be integrated into various workflows

A Record Summary provides an easy way to visualize trust markers and better understand the contents of an ORCID record.

- They can be displayed directly within editorial systems and link to the full record.
- ... and pulled from our APIs and reused in other tools and workflows.
Researchers can access a summary view of their own records, and see others’ Record Summaries.

It contains the same information as the one embedded in the editorial workflow.

The Record Summary is also available directly from ORCID records.

### Record Summary

**Find out more about record summaries**

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<tr>
<th><strong>AFFILIATIONS</strong></th>
<th><strong>WORKS</strong></th>
<th><strong>PROFESSIONAL ACTIVITIES</strong></th>
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<td>- ORCID</td>
<td>- 7 Self-asserted works</td>
<td>- Max-Delbrück-Centrum für Molekulare Medizin in der Helmholtz-Gemeinschaft</td>
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<tr>
<td>2016-01-07 to present Director of Product employment</td>
<td>- 21 Validated works</td>
<td>2021-10-20 - 2022-11-02 Grant Reviewer service</td>
</tr>
<tr>
<td>- British Library</td>
<td>- 2 Self-asserted writings</td>
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<tr>
<td>2013-06-03 to 2014-12 Technical Lead employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ 1 more Affiliation</td>
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</table>

**KEY DATES**

- Recent created: Jan 18, 2013
- Last updated: Apr 4, 2024

**Personal information**

<table>
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<tr>
<th><strong>Emails</strong></th>
<th><strong>Keywords</strong></th>
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<tbody>
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<td><a href="mailto:t.demranville@orcid.org">t.demranville@orcid.org</a></td>
<td>awesome</td>
</tr>
</tbody>
</table>

**Biography**

ORCID Product Director. A technical background in innovation, software engineering and identity management.

**Activities**

- **Employment (1)**

**ORCID: Bethesda, US**

2018-02-14 to present | Director of Product
Employment

Source: ORCID via ORCID Member Portal

**LAUNCHED LAST MONTH!**
Trust markers are more common than you think

44% of active records have a trust marker
It takes action from the whole community to build trust

**Publishers**

Many publishers mandate collecting ORCID iDs, and most manuscript systems can collect ORCID iDs, but coverage can be patchy as not all editors have switched this option on.

**Collect during submission**

**Institutions**

Many institutions invest heavily in keeping their CRIS/ERA systems up to date, and have systems that can automatically update ORCID records but not all institutions have enabled the ORCID functionality in these systems.

**Turn on synchronization**

**ORCID**

There are 2.25m active ORCID records that we can match with ORCID members based on their email address — can we connect them up?

**Enable the connections**
ORCID’s Members form our Community Trust Network
Think of ORCID as a *hub* of research-related data that gets propagated throughout scholarly systems

The more **fully-populated** ORCID records and integrated systems there are, the more value that all stakeholders can gain from adopting ORCID.

https://youtu.be/1Z7eR7Hnds0?si=ggxYHgTTPAHUEQ5e
Propagating trust markers throughout the research ecosystem can have a positive effect on research integrity.
More Trust Markers = More Trustworthiness
As more ORCID members add data (and trust markers) to records, the more robust the entire scholarly record becomes.
Each source of data has its own mechanisms to ensure trustworthiness

- Can only be added by ORCID member organizations
- Subject to membership agreement terms
- Added via authenticated API
- Data can be retracted by member
- Collected via authenticated workflows
- Community-monitored
- Subject to dispute procedure
- Record can be locked if not corrected
ORCID’s community trust network spans the globe

Users in 250 countries
Almost every country on the planet!

2023
1.62B items
of data in ORCID records was reused by external systems

Member organizations in 58 countries
27 national consortia and 1 regional consortium

Yearly Active Researchers
8.4 Million

Active Integrated Systems
5,693

Organizational Members
1,392

Data collected on 20 May 2024
More data available at https://info.orcid.org/orcid-statistics/
Each of our stakeholder groups has a role to play in our community trust network.
Publishers add a lot of validated works and peer review trust markers.
Trust markers help publishers during the editorial process

- We’re working with publishers (and vendors) to **ensure that authenticated ORCID IDs are collected for ALL reviewers, editors and authors, including co-authors.**

- We’re working with institutions (and vendors) to **increase the quantity of validated affiliation data** in the registry.

“It is clear that ORCiD adoption is an important tool in combating paper mills. Requiring authors to register an ORCiD and to associate their ID with the paper at the time of submission decreases reliance on fully automated disambiguation methodologies and strengthens our approach. Relatively low ORCiD adoption rates are effectively keeping a low bar for paper-mill activity. The call for system wide change with regard to ORCiD is not new, but it is certainly now more urgent.

Funders play an integral role in adding trust markers

We’re working with funders and other persistent identifier providers to **PID-enable** the entire **funding workflow**
Government policy makers are influencing PID adoption by setting national policies and strategies

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<thead>
<tr>
<th>Country</th>
<th>Policy/Strategy</th>
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</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian National Persistent Identifier (PID) Strategy and Roadmap 1</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Netherlands: NWO Persistent Identifier Strategy 2</td>
</tr>
<tr>
<td>USA</td>
<td>USA: “Nelson” Public Access Memo 5</td>
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<tr>
<td>USA</td>
<td>USA: NSPM-33 6 Presidential Memorandum on United States Government-Supported Research and Development National Security Policy</td>
</tr>
<tr>
<td>Italy</td>
<td>Italy: National Open Science Plan 3</td>
</tr>
<tr>
<td>Joint Statement</td>
<td>Joint Statement of Principle: Adoption and use of ORCID identifiers in New Zealand 4</td>
</tr>
</tbody>
</table>

3. Translated from: https://www.mur.gov.it/sites/default/files/2022-06/Piano_Nazionale_per_la_Scienza_Aperta.pdf
4. Joint statement by The Health Research Council of New Zealand, the Independent Research Association of New Zealand, the Ministry of Business, Innovation and Employment, the Ministry of Education, the Ministry for Primary Industries, the New Zealand Association of Scientists, the Royal Society of New Zealand, Science New Zealand, the Tertiary Education

“Adoption of ORCID in Australia has already demonstrated the value of PIDs. Incentives estimates that by using ORCIDs to populate research grant applications, the Australian Research Council (ARC) has saved researchers up to 3 or 4 days per grant application.”

“As a matter of principle we: 1. Strongly encourage the use of ORCID iD across the research and science system 2. Commit to support the use of ORCID iD as a common researcher identifier across New Zealand’s research and science system.

“Encourage the full use of ORCID-ID for each researcher, in its functionality of enabling and connect services, including those related to citations”

“metadata should include at minimum: all author and co-author names, affiliations, and sources of funding, referencing digital persistent identifiers, as appropriate”

“Adoption of ORCID in Australia has already demonstrated the value of PIDs. Incentives estimates that by using ORCIDs to populate research grant applications, the Australian Research Council (ARC) has saved researchers up to 3 or 4 days per grant application.”

“Recommendation 1: Implement ORCID iD for researchers into grant application, peer review, and project reporting workflows:

“… funding agencies shall establish policies regarding requirements for individual researchers supported by or working on any Federal research grant to be registered with a service that provides a digital persistent identifier for that individual.”

“metadata should include at minimum: all author and co-author names, affiliations, and sources of funding, referencing digital persistent identifiers, as appropriate”

“Adoption of ORCID in Australia has already demonstrated the value of PIDs. Incentives estimates that by using ORCIDs to populate research grant applications, the Australian Research Council (ARC) has saved researchers up to 3 or 4 days per grant application.”
We’re enabling vendors to make it easier for members to expedite the contribution of trusted data

**Specific best-practice ORCID certification criteria for 5 scholarly workflows:**

1. Manuscript Submission Systems
   - [Aries Systems](#)
   - [Editorial System](#)
   - [PKP](#)

2. Research Information Systems
   - [Dspace CRIS](#)
   - [Symplectic Elements](#)
   - [IFs](#)

3. Grant/Facility Application Management Systems
   - [infoEd Global](#)
   - [OBD](#)
   - [Esploro](#)

4. Repository Systems

5. Discovery Systems (New)

**Benefits to organizations using a CSP**
- Out-of-the-box, best-in-class ORCID-related functionality
- No need for custom technical development
- A more consistent user experience
- Training and support support from the vendor

**Benefits for vendors offering CSPs**
- Enhanced Promotion from ORCID:
  - Listing on our website
  - Recommendation to members
  - ORCID CSP Badge
  - Certification letter for proposals/tenders
- Enhanced Support from ORCID
- Advanced reporting

[https://info.orcid.org/vendors-and-service-providers/become-an-orcid-certified-service-provider/](https://info.orcid.org/vendors-and-service-providers/become-an-orcid-certified-service-provider/)
Trust Markers in action: Use Cases from our Community
Researchers love ORCID and want to use it everywhere!

Madhu Pai, MD, PhD @paimadhu · Mar 29
Hey publishers & editors,

Do you want to help prevent burnout & stress among scientists?

Just allow us to log into ALL journals with one single ID (e.g. @ORCID_Org)!

Signed

All researchers/authors

- 46 Member organizations
- 36 completed integrations
- 4000 Affiliation items added via the Affiliation Manager
- #DSpace and #OJS are predominant

Dr. Ed Emmott @edemmott · Apr 29
Replying to @astacus and @ORCID_Org

Yup. Last submission I had to manually include full affiliations and emails for every author on initial submission. Took nearly an hour...

ORCID: ORCID.org

Researchers - if I can work out your @ORCID then I can assist in improving your citation metrics. If you haven’t provided ORCID with enough information then we can’t link your papers via #WOS, #WoS, #Scopus, #SCOPUS, #SciVerse, #SciVerseScopus, #EndNote, #EndNoteX, #Reference Manager, #EndNotePro, and #ResearchGate via @OSNU. And we can’t link your collected specimens via @OSNU.

Check out the ORCID blog for more information: https://blog.orcid.org/category/blog/
ORCID member organizations are adding more trust markers all the time!

First “trust marker” use case blog post
Our top twenty integrations have contributed 46 million trust markers!

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<td>Aarhus University Library</td>
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Trust markers can help researchers access highly protected medical research data more quickly

“...since ORCID enables a collection of research activities in one place, reviews are much more efficient for applicants who have linked their ORCID iD.”

- Brian Gow, Tom Pollard,

PhysioNet

Application for Credentialed Access

Please use the form below to apply for DataShare credentialing. In order to apply:

- Complete the CITI Program in "Data or Specimens Only Research", an online course that covers ethics of human research and patient privacy. Instructions are provided here.
- If you have an ORCID iD please link to it in your settings (ORCID settings) as this may help us expedite your application by making it easier to verify your identity.
Trust markers help Ripeta assess the quality of reporting and the robustness of authors and the scientific method.

“...As part of its services, Ripeta is able to check an author’s history for any potential research integrity flags. To do so, it uses trust markers related to ORCID.”

- Simon Linacre,
Ripeta
Elevating trust and integrity in research takes all of us

Restoring trust in the scholarly record is a multifaceted process.

ORCID and our peer PID and infrastructure providers have a critical role to play.

It is everyone’s responsibility to commit to solutions (& contribute trusted data!)
We’re glad you joined us!

Chris Shillum
Executive Director
https://orcid.org/0000-0002-1108-3660

Tom Demeranville
Director of Product
https://orcid.org/0000-0003-0902-4386

Julie Petro
Director of Communications
https://orcid.org/0000-0003-4967-747X

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